FARM AND FIELD.

GENERAL RULES DIRECTING THE PLOUGH.

A question every season presenting itself is whether to plough during the fall or spring. This question must be answered in each case according to the attendant circumstances. In a word no definite rule may be laid down by which to govern either the time or manner of ploughing, but each piece of land must be considered by itself, and broken up at a season and in a style best suited to its especial necessities. To decide that soil shall be ploughed spring or fall, deep or shallow, without considering the character of the soil, the locality, and the nature of the crop to be grown, is downright folly.

While judgment is required in this matter of ploughing, and every farmer must decide many questions for himself, there exist some general rules that will assist him in arriving at proper conclusions. For instance, heavy clay soil appears to require the alternate freezings and thawings of winter to pulverize it. Again, fields overrun with weeds are benefited by fall ploughing, which turns under these noxious growths with the haulm of the crop before their seed matures, and not only destroys but forces them to enrich the land they previously encumbered. The exposure of injurious insects to the weather is another condition urging fall ploughing. On the other hand, light, sandy land generally speaking, is best ploughed in the spring.

As regards the problem of deep and shallow ploughing, that must be settled by the depth of the soil and the character of the subsoil. Land that is dry with only a few inches of good soil calls for shallow ploughing, while a deep, rich soil as a rule is more productive when deeply ploughed. When the surface soil is shallow the gradual deepening of it ought to be sought by the use of appropriate materials for improvement, until the object is fully attained.

The subsoil ought not ordinarily to be brought out of its bed, except in small quantities, to be exposed to the atmosphere during the winter, or in a summer fallow; nor even then, except when suitable fertilizers are applied to put it at once into a productive condition. Soils of opposite character, as a stiff clay and sliding sand, sometimes occupy the relation of surface and subsoil to each other. When such a condition exists, deep cultivation that thoroughly incorporates the two will hardly fail to produce a soil of enhanced value. River soils, having perfect natural drainage, respond favourably to deep ploughing, as do the black, porous, and fertile limestone soils. Deep ploughing is ill-advised when a basin is formed below a certain line, in which water will settle and remain until it can escape by evaporation. Such soils require drainage, after which the plough may be set deep with advantage.

Shallow soils can and ought to be gradually deepened. These must, of course, when the subsoil is worthless, be lightly cultivated until the farmer is ready to give additional labour and expense to their improvement. But so soon as he can practise for a few years subsoiling and manuring, so soon will his shallow land become valuable, and increased crops repay him for extra expense of labour. Where all circumstances are favourable to the use of a subsoil plough an increase of crops follows, for the hard earth, below the reach of the ordinary plough, has been loosened. This permits the escape of the water which falls on the surface, the circulation of air, and a more extended range for the roots of deep-growing plants, by which they procure additional nourishment and secure the crop against drought. The benefits of subsoil ploughing are most apparent in an impervious clay subsoil, and least evident in loose and leachy ones.

From the foregoing it will appear to the careful reader that thin soils with poor subsoils must be ploughed shallow, unless subsoiling and manuring are resorted to; that deep clay loams and alluvial soil bear deep ploughing, and wet lands must be drained previous to deep ploughing. The medium course—which is ploughing from five to six inches deep—is exempt from the harmful results of the two extremes.

On low or strong lands experienced farmers give the preference to a furrow left on edge exposed to the action of air and harrow. On sandy or dry soil they practise flat ploughing, which tends to consolidate the land. Experienced farmers avoid breaking up ground that is too wet, or running the plough through ground too dry. The effects in either case are pernicious. Sufficient moisture is required to cause the furrows to fall loosely from the plough with no appearance of packing and no lumps.

A VALUABLE TABLE.

5 yards wide by 968 yards long contains one acre.

10 yards wide by 484 yards long contains one acre.

20 yards wide by 242 yards long contains one acre.

40 yards wide by 121 yards long contains one acre.

80 yards wide by 60½ yards long contains one acre.

70 yards wide by 65½ yards long contains one acre.

220 feet wide by 198 feet long contains one acre.

440 feet wide by 92 feet long contains one acre.

110 feet wide by 369 feet long contains one acre.

60 feet wide by 726 feet long contains one acre.

120 feet wide by 363 feet long contains one acre.

240 feet wide by 181½ feet long contains one acre.

In laying off small lots the following measurements will be found to be both accurate and complete:

52½ feet square or 2,722½ square feet is 1-16th of an acre.

74⅜ feet square or 5,415 square feet is ⅛th of an acre.

104½ feet square or 10,890 square feet is ¼th of an acre.

120½ feet square or 14,520 square feet is ⅓ths of an acre.

147½ feet square or 21,789 square feet is half of an acre.

208⅜ feet square or 43,560 square feet is one acre.

EVERY FARMER NOT HIS OWN CHEMIST.

In the many ways in which the agricultural chemist can serve the farmer none can be made more directly and immediately valuable than those analyses that inform him as to the quantity and the degree of solubility of the compounds of nitrogen, phosphoric acid, and potash in the fertilizers offered to him in the markets. But the cost of such service greatly narrows the range of its practical benefits. Very few farmers indeed, wishing to select the best from a number of brands, could afford to have samples of all these brands analysed, so that they might purchase intelligently, as they would a cow or a horse, with some real knowledge of the merits of the article purchased; consequently as a general thing, the purchase is made blindly, or else on no sounder basis than recommendations by others or previous experience of their own or their neighbours with the same brand. The few Experiment Stations in this country are doing something to meet this want; but their number is too small and they are provided with too small a working force, so that they can do but a small part of what is needed in this direction, unless they neglect altogether the investigation of questions of a wider and more enduring importance. As their name implies, they are established to try experiments in agriculture, for the improvements of agricultural practice; but analyzing fertilizers is not trying experiments.

The farmer feels the need of the better knowledge, not only of these commercial fertilizers that the chemist can give him, but also, often, of materials from nearer home, such as mucks and marls; he knows that with such knowledge of their condition, as to valuable plant nutrients, he might save wasted labour over worthless ones, or be led to the development of unexpected manure mines in his own fields.

Such is the feeling of a friend in Florida, who some little time ago wished *The Tribune* to tell him how to ascertain for himself whether these materials contain any phosphoric acid, potash, or nitrogen, and whether much or little. Incidentally he asks also why a marl put in vinegar will foam; it is because the marl contains carbonate of lime, whose carbonic acid is driven off as a gas by the stronger acid of the vinegar, and the more violently the sample of marl foams under this treatment, the more carbonate of lime it contains.

Now if it were as easy a matter to find and measure ammonia, phosphoric acid, or potash, as it is to find and measure approximately carbonic acid or carbonates, it would be easy to teach our friend to be his own chemist; but it is very far from being so simple. Marl or mucks contain either no ready formed ammonia or so little, and so little potash too, as to require usually considerable chemical skill to show their presence; as the phosphoric acid in the case is somewhat better, but nevertheless professional skill is necessary here also to make out with safety the difference between the different samples. Such skill cannot be communicated through the columns of a newspaper, without the possession already of some practical knowledge of chemical manipulation on the part of the reader. Every bed of muck may contain a manure mine; there is one sure way to find it, better even than the chemist's, which is to try the muck on the land; little expense will be necessary, no harm can be done, in all probability something will be gained in better crops, and good profits may be reaped. It is always worth while to make the trial if the muck bed is easily accessible.—*Dr. G. C. Caldwell, in N. Y. Tribune.*

SOILS ADAPTED FOR HARD WOOD TREES.

Long observation and diligent research appears to have proven that mild loamy soil in which sand and lime are present in a higher degree than clay—fresh, deep, and rich in vegetable mould—is favourable to the growth of many forest trees, such as the oak. Lime is best suited for beech, ash, maples, elms, black and Austrian pines, dwarf pine and yew. A binding clay without sufficient humus is not adapted for forest trees. In the heat of summer it cracks and injures the rootlets. Soils, if rich minerally, although these yield trees of greater height and solid contents,